



"STAR"



- USER'S MANUAL -

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- **READ THE INSTRUCTIONS CAREFULLY** before connecting charger to mains and battery.



"STAR" battery charger

USER MANUAL

VERSIONS : THREE-PHASE

INSTALLATION / USE / OPERATION

To use the charger, you have to abide by safety prescriptions contained in laws and regulations and in the provisions made by Local Authorities.

Obligations of the "user" : conforming to the operating instructions, the "user" is any natural or juridical person using directly P.B.M. battery chargers or anyone using them for account of the above mentioned person. Under special circumstances, e.g. leasing, renting, the "user" is the person who takes following obligations according to the agreements made by owner and user.

The "user" will be responsible for the installation site of the charger. He shall check, whether very sensitive appliances are disturbed by the influence of the battery charger. He shall choose such an installation site, that the operation of the charger does not affect the functioning of electromagnetic devices and magnetic data carriers (e.g. pace makers, monitors, magnetic disks and diskettes, magnetic tapes, magnetic cards, watches etc.), since a high direct current produces interference magnetic fields.

The "user" shall make sure that the use of P.B.M. battery chargers conforms to the rules in force, that any action is avoided which may endanger life and safety of the user or third parties or which may damage things.

The "user" shall make sure that users and operators have read and understood the operating manual and that they abide by the accident prevention and safety rules and the use and maintenance provisions.

A) INSTALLATION AND SAFETY WARNINGS

READ THE MANUAL CAREFULLY before connecting charger to mains and battery.

- Skilled and authorised personnel only shall be allowed to open the charger.
- Before setting the charger at work, the insulation of mains connection cable and battery connection connectors has to be checked.
- The electrical appliances have to be operated by skilled personnel only.
- Disconnect from mains before connecting or disconnecting battery.
- **BE CAREFUL !!** Batteries produce explosive gases while being recharged, therefore there must be neither flames nor sparks near the charger while it is in operation. Keep the charger far away from other appliances which may endanger people and objects.
- The charger contains electrical components which may produce voltaic arcs and sparks, therefore if it is used in a closed environment it has to be installed in a proper site. The standard charger (IP 20) is to be used in closed and ventilated environments only and not exposed to rain nor splashed with water. It has to be positioned onto solid and flat floors, far away from dust, water, heating, and moisture.
- The charger has not to be positioned onto supports and/or shelves of wood or other inflammable materials. Do not stock materials near the charger and do not place any objects and fluid containers on the charger top.
- Ensure that an **adequate earth connection** is made to prevent risks of electrocution. The charger has to be connected to a mains supply of standards corresponding to the power of the charger and has to be protected through a suitable electrical protection system (fuse or automatic cut-out) complying with European Standards. The protection needs at least a 10% higher setting than the power input of the device; furthermore the device has to be protected from a too high contact voltage, according to the provisions made by Local Authorities.
- It is recommended to use **bipolar standard connectors** which do not allow a polarity reversal on battery; check the **proper connection of cables in the contacts of the connectors (connectors with oxidized contacts may produce sparks or fires)**.
- Do not use patch cords to prolong the existing electrical connections.



- It is recommended to use batteries in good state. Therefore check them regularly.
- Do not modify the P.B.M. chargers, and in particular their safety systems.
- Problems in the electrical components have to be removed by skilled personnel only. Defective parts have to be replaced with other components with the same features. Replacements need to be authorized by the manufacturer.
- Check regularly all internal electrical connections. Make sure that cables and terminals have not been damaged by overheating due to a bad contact ; remove dust (in particular from contactor and moving parts).
- P.B.M. battery chargers do not need any special maintenance, apart from the usual cleaning which has to be performed regularly depending on the installation site. Before cleaning the charger, disconnect it from mains and battery.

B) CONNECTION TO MAINS

It is essential to connect the charger to a mains supply corresponding to the power of the battery charger installed and equipped with protection fuses (s. the values on the rating plate).

Make sure **to earth the charger properly**.

The charger is pre-set for a **THREE-PHASE 400V AC** mains voltage.

If the charger has to be pre-set for a **THREE-PHASE 230V AC** mains voltage:

- move pins on the terminal board for voltage change (**CT**)
- change the connection on the auxiliary transformer (**TA**)
- replace the mains fuses on the external panel with the right ones

C) ADJUSTMENT TO MAINS VOLTAGE

During installation, or after changing installation site, it is advisable to **check the actual value of the mains voltage** present at the installation site of the charger. If it is too high or too low compared to the rated values, problems due to **drops or increases** in the charging current might arise.

The charger is usually pre-set for a 400V AC $\pm 5\%$ or a 230V AC $\pm 5\%$ mains voltage. Check mains voltage and, if required, adjust the connection of mains voltage to the transformer by means of the **adjusting terminal board** on the transformer. The above adjustment has to be performed by skilled personnel only.

D) CONNECTION TO BATTERY

We advise the use of **bipolar standard connectors** which do not allow reverse polarity on battery.

Check **cable connection in the connector contacts**.

The above check has to be performed by skilled personnel only.

E) CHARGING PROCESS (standard configuration)

- Once mains and battery connections have been performed, **the card performs a lighting test of all LED's**. Then the **green "BATTERY CONNECTED"** LED remains lit (constant).
- In the standard configuration the **"AUTOSTART"** function is enabled (as **default setting**): the charger begins automatically charging 5 seconds after connection to battery. The Autostart stage is indicated by the blinking of the **green "END OF CHARGING"** LED, **red "SAFETY TIMER"** LED, and **yellow "EQUALIZING CHARGE"** LED.
- If the Autostart function is disabled, press the **GREEN button** to start the charging process. The **green LED ("CHARGING")** begins blinking, and **it will blink for the whole charging process**. To stop charging, press the **GREEN button again**.
- After the initial charge stage, depending on the discharge rate of the battery, and provided that the average cell voltage has reached 2.4 V/cell (adjustable value), the **yellow "FINAL CHARGE"** LED will light up on the front control panel. Then an electronic timer starts counting down the **last three hours** of final charge.
- When the final charge time (adjustable value) has elapsed, the charger stops automatically and the **green "END OF CHARGING"** LED lights up.
- If the operator disconnects charger from battery during a charging process, the battery charger stops temporarily the charging process and signals a fault by means of the yellow LD4 LED blinking. On connecting a battery to the charger, the card resets and starts the charging process again. If the same battery is connected again to the charger, the charger will disregard any final charge, which it might have begun previously (only SW 2.1b)



F) EQUALIZING CHARGE

The equalizing charge will be performed only if the charger has correctly completed the normal charge (**green "END OF CHARGING" LED**).

The equalizing charge consists of the following stages:

- a) a 1h-long pause
 - b) a 5min-long charging cycle
 - c) a 55min-long pause cycle
- The **b)** and **c)** pulses will be repeated 48 times (that is 2 days or a weekend)
- d) a 120h-long pause (5 days) after which the cycle is repeated as described above (see **b** and **c**).

G) SPECIAL FUNCTIONS

The new **STAR** charger with microprocessor card features special functions which can be selected by the operator, depending on his/her own needs, by means of the jumpers on the **PBM750** electronic card, according to the following description :

Jumper code	Function	Function description	
		Without jumper	With jumper
TV	Quick test	Normal times	Accelerated times
CF4	Final charge time	3-h final charge time*	4-h final charge time
AS5	Standard Autostart	Manual start	Autostart after 5 sec*
A3H	Delayed Autostart		Autostart after 3 h
CPR	Proportional charge	Proportional charge not enabled*	Proportional charge enabled
CI11h	Safety timer	Safety timer set at 9h*	Safety timer set at 11h
CEQ	Equalizing charge	Not programmed	Programmed*

The PBM750 rev2 card features an additional jumper (J3) with the function described below:

Jumper code	Function	Function description	
		REG*	FIX
J3	Setting of the gassing voltage	Threshold adjustable by means of a trimmer	Fix threshold preset between 2.37 and 2.43V/cell

* = default programming

PLEASE NOTE: Before inserting jumpers to achieve the above-mentioned functions, disconnect charger from battery, otherwise the microprocessor will not accept the settings performed.

The above configuration has to be performed by skilled personnel only.

H) WARRANTY

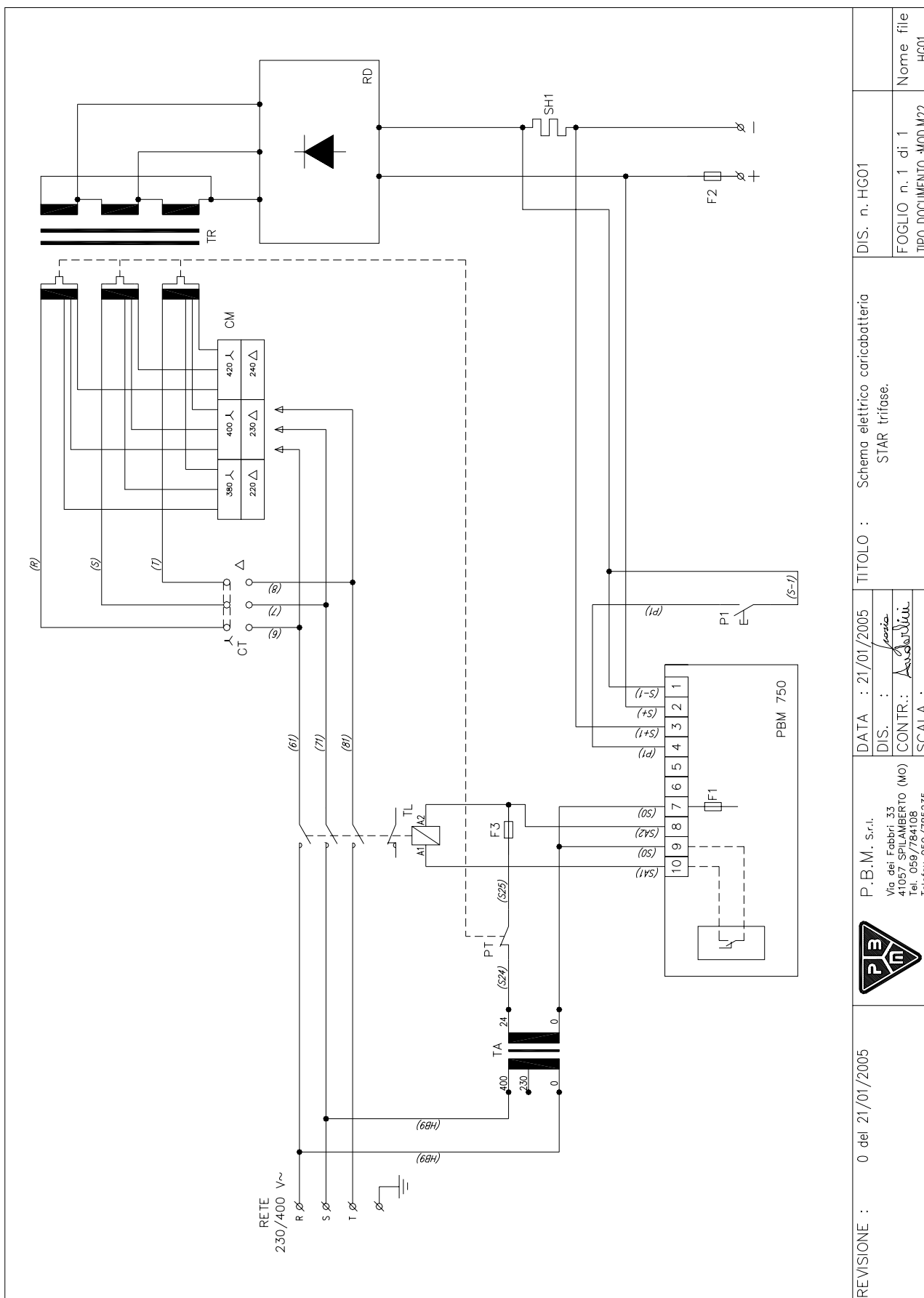
- The charger is guaranteed for 12 months from the date of installation.
- The guarantee covers all proven defects in components, assembly and construction.
- Any incorrect installation or use of the machine NULLIFIES the guarantee.
- Any unauthorised tampering NULLIFIES the guarantee.
- In case of difficulties please contact the LOCAL DEALER or P.B.M. S.r.l.

I) COMPONENTS LIST (see wiring diagram no. **HG01 rev.0**)

F1	Auxiliary fuse 500 mA - (glass 5x20)
F2	Fuse on battery-side output, NH00 A-T or NH1 A-T
F3	Auxiliary fuse 1.6 A-T (glass 5x20)
TL	Three-pole line contactor + NC / 24VAC
CM	Terminal board with pins for adjustment to mains
CT	Terminal board for voltage change 230/400V
TR	Three-phase transformer (PT series)
RD	Diode rectifier bridge
SH	Shunt 100A/100mV - 200A/200mV
P1	ON-OFF button for normal charge
PBM750	Electronic control card with microprocessor
TA	Auxiliary transformer 30 VA 0-230-400 V / 0-24 V



WIRING DIAGRAMS



DECLARATIONS OF CONFORMITY

file: CE Declaration-STAR-rev0-061211.doc



DECLARATION OF CONFORMITY

We

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declare under our sole responsibility that the following product

Product type: BATTERY CHARGER**Name: STAR****Models:**

24V/50A, 24V/60A, 24V/70A, 24V/80A, 24V/90A, 24V/100A, 24V/120A, 24V/140A, 24V/160A,
 24V/180A, 24V/200A
 36V/60A, 36V/70A, 36V/80A, 36V/90A, 36V/100A, 36V/120A, 36V/140A, 36V/160A, 36V/180A
 48V/50A, 48V/60A, 48V/70A, 48V/80A, 48V/90A, 48V/100A, 48V/120A, 48V/140A, 48V/160A,
 48V/180A, 48V/200A, 48V/220A, 48V/240A
 72V/60A, 72V/70A, 72V/80A, 72V/90A, 72V/100A, 72V/120A, 72V/140A, 72V/160A
 80V/30A, 80V/40A, 80V/50A, 80V/60A, 80V/70A, 80V/80A, 80V/90A, 80V/100A, 80V/120A,
 80V/140A, 80V/160A, 80V/180A, 80V/200A, 80V/220A, 80V/240A, 80V/260A, 80V/280A, 80V/300A
 96V/50A, 96V/60A, 96V/70A, 96V/80A, 96V/90A, 96V/100A, 96V/120A

Options: ALL

to which this declaration relates complies with the requirements of the following Directives of the European Union:

73/23/EEC (LVD), amended by **Directive 93/68/EEC** and following modifications
 and

89/336/EEC (EMC), amended by **Directive 93/68/EEC** and following modifications

Standards to which conformity is declared:

Safety: CEI EN60335-1: (04-2004)
EMC: CEI EN61000-6-2 : (10-2002)
 CEI EN61000-6-3 : (10-2002)
 CEI EN50366 : (02-2004)
 including amendments

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VIGNOLA

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QUALITY SYSTEM CERTIFICATION

UNI EN ISO 9001:2000 n° LRC 141297